

claim

1 1. (Currently Amended) A liquid crystal display device, comprising:
2 a first substrate;
3 a second substrate facing said first substrate;
4 a liquid crystal layer interposed between said first and second substrates; and
5 a group of electrodes disposed on said first substrate so as to create an electric
6 field in said liquid crystal layer generally parallel to said first substrate in an activated state in
7 which a drive voltage is applied to said group of electrodes,
8 said liquid crystal molecules aligning generally perpendicularly to a plane of
9 said first substrate in a nonactivated state in which said drive voltage is not applied to said
10 group of electrodes, said liquid crystal molecules aligning generally parallel to said plane of
11 said first substrate in said activated state,
12 said liquid crystal molecules having a pre-tilt angle of less than 90° in at least
13 one of a part of said liquid crystal layer corresponding to a pixel and said electrodes on said
14 first substrate,
15 wherein said electrodes include a first electrode of a an opaque metal provided
16 on a surface of said first substrate facing said second substrate and a second electrode of a an
17 opaque metal provided on said surface with a separation from said first electrode, the
18 separation creating a space which is part of the pixel, said first and second electrodes being
19 provided outside a display area in which transmission of an optical beam is turned on and off,
20 and

21 C¹ wherein said liquid crystal display device further includes a first projection
22 provided on said first electrode and a second projection provided on said second electrode,
23 said first and second projections inducing said pre-tilt angle in said liquid crystal molecules
24 located adjacent to said first and second projections.

2-3. (Cancelled)

1 C² 4. (Original) A liquid crystal display device, comprising:
2 a first substrate;
3 a second substrate facing said first substrate;
4 a liquid crystal layer interposed between said first and second substrates; and
5 a group of electrodes disposed on said first substrate so as to create an electric
6 field in said first substrate in an activated state in which a drive voltage is applied to said
7 group of electrodes;
8 said liquid crystal molecules aligning generally perpendicularly to a plane of
9 said first substrate in a non-activated state in which said drive voltage is not applied to said
10 group of electrodes,
11 said liquid crystal molecules aligning generally parallel to said plane of said
12 first substrate in said activated state;

13 said liquid crystal layer having a birefringence larger than about 0.10 but
14 smaller than about 0.25.

C2

1 5. (Original) A liquid crystal display device as claimed in claim 4, wherein
2 said liquid crystal layer contains a tolan-family component.

1 6. (Currently Amended) A liquid crystal display device, comprising:
2 a first substrate;
3 a second substrate facing said first substrate;
4 a liquid crystal layer interposed between said first and second substrates; and
5 a group of electrodes disposed on said first substrate so as to create an electric
6 field in said liquid crystal layer generally parallel to said first substrate in an activated state in
7 which a drive voltage is applied to said group of electrodes; and
8 a molecular alignment film provided on said first substrate so as to cover said
9 electrodes,
10 said liquid crystal molecules aligning generally perpendicularly to a plane of
11 said first substrate in a nonactivated state in which said drive voltage is not applied to said
12 group of electrodes, said liquid crystal molecules aligning generally parallel to said plane of
13 said first substrate in said activated state,

14 said liquid crystal molecules having a pre-tilt angle of less than 90° in at least
15 one of a part of said liquid crystal layer corresponding to a pixel and said electrode on said
16 first substrate,

17 wherein said electrodes include a first electrode of a an opaque metal provided
18 on a surface of said first substrate facing said second substrate and a second electrode of a an
19 opaque metal provided on said surface with a separation from said first electrode, the
20 separation creating a space which is part of the pixel, said first and second electrodes being
21 provided outside a display area in which transmission of an optical beam is turned on and off,
22 and

23 wherein said liquid crystal display device further includes a first region in said
24 molecular alignment film in correspondence to said first electrode and a second region in said
25 molecular alignment film in correspondence to said second electrode, said first and second
26 regions being formed by ultraviolet irradiation and inducing said pre-tilt angle in said liquid
27 crystal molecules located adjacent to said first and second regions.
